VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY

JNANASAGARA CAMPUS, BALLARI-583105

DEPARTMENT OF STUDIES IN

PHYSICS

SYLLUBUS

Master of Science in Physics

(I – IV Semester)

Effective From

2021-22

VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY
Department of PHYSICS
Jnana Sagara, Ballari - 583105

Distribution of Courses/Papers in Postgraduate Programme I to IV Semester as per Choice Based Credit System (CBCS) Proposed for PG Programs

II-SEMESTER

Semester	Category	Subject code	Title of the Paper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
				IA	SEE	Total	L	T	P		
SECOND	DSC5	21PHY2C5L	Computational Physics	30	70	100	4	-	-	4	3
	DSC6	21PHY2C6L	Quantum Mechanics	30	70	100	4	-	-	4	3
	DSC7	21PHY2C7L	Condensed Matter Physics	30	70	100	4	-	-	4	3
	DSC8	21PHY2C8L	Nuclear Physics	30	70	100	4	-	-	4	3
	SEC2	21PHY2S2LP	Model based Design of Physical Devices/ Systems	20	30	50	1	-	2	2	1
	DSC5P3	21PHY2C5P	Computational Physics Lab	20	30	50	-	-	4	2	4
	DSC7P4	21PHY2C7P	Condensed Matter Physics Lab	20	30	50	-	-	4	2	4
	DSC8P5	21PHY2C8P	Nuclear Physics Lab	20	30	50	-	-	4	2	4
Total Marks for II Semester						**600**				**24**	

Department Name: PhysicsSemester - II

Course Title: Computational Physics	**Course Code:** 21PHY2C5L
Total Contact Hours: 55 Hours	**No. of Credits:** 04
Formative Assessment Marks: 30	**Duration of ESA/Exam:** 03 Hours
Summative Assessment Marks: 70	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Write C-Program to simple situations.
2. Solve physical problems using numerical techniques.
3. Apply partial differential equations to physical systems.
4. Explain the basic concepts of probability and statistics.
5. Compute errors in any physical problems and experiments.

DSC5: Computational Physics (21PHY2C5L)

Unit	Description	Hours
1	**C Programming** Compiler and interpreter, constants and variables, arithmetic expressions, data types, input and output statements, control statements, switch statements, loop statements, format specifications, arrays, algorithms, flowcharts, functions. Simple C programs i) area of a triangle ii) to check the entered letter is an vowel or consonant using switch iii) computing the sum and average of ten numbers using one dimensional arrays iv) to calculate Fibonacci series using while loop v) sorting numbers in ascending and descending order vi) computing the factorial of a number using for loop vii) addition of two matrices using arrays. (Ref. 1 & 2)	11
2	**Numerical Techniques** Numerical methods. Solutions of algebraic and transcendental equations: Bisection and Newton-Raphson methods. Interpolation: Newton's and Lagrange's methods. Curve fitting: Method of least squares. Differentiation: Newton's formula. Integration: Trapezodal rule, Simpson's 1/3 and 3/8 rules. Solutions of ordinary differential equations: Euler's modified method and Runge-Kutta	11

	methods. Gauss elimination method for solving a system of linear equations. (Ref: 3 & 4).	
3	**Partial Differential Equations and applications in Physics** Basic Concepts of PDEs, Modeling: Vibrating String, Wave Equation, Solution by Separating Variables. D'Alembert's Solution of the Wave Equation. Characteristics, Modeling: Heat Flow from a Body in Space. Heat Equation, Heat Equation: Solution by Fourier Series. Steady Two-Dimensional Heat Problems. Dirichlet Problem, Heat Equation: Modeling Very Long Bars. Solution by Fourier Integrals and Transforms, Laplace's Equation in Cylindrical and Spherical Coordinates. (Ref: 5).	11
4	**Probability** Introduction, Basic probability theorems, Conditional probability - Theorem, permutations and combinations – Theorems, Random variables – Introduction, Discrete random variables and distributions, Continuous random variables and distributions, mean and variance of a distribution, Transformation of mean and variance, Binomial distribution, Poisson distribution and Normal distribution. (Ref: 5 & 6). **Mathematical Statistics** Introduction, Concept of random sampling, Point estimation of parameters – Maximum likelihood method, Confidence intervals - Normal distribution with known and unknown σ^2, Chi-square distribution, Central Limit theorem (without proof). (Ref: 5 & 6)	11
5	**Experimental measurements and errors** Types and sources of experimental errors, significant digits in measurements, evaluation of errors in derived quantities with more than one variable, propagation of errors, mean and standard deviation, estimation of error, reporting experimental results with error bars. (Ref: 7 & 8). Data fitting: Lagrange interpolation and least squares fit methods, specific example of fitting experimental data on exponential decay, goodness of fit. Error analysis: Estimation of errors in the numerical integration and differentiation in the specific example of exponential decay (Ref: 3 & 5).	11

References:

1. Computer Concepts and C Programming by P. B. Kotur, Sapna Book House (P) Ltd., Bangalore,

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Department Name: PhysicsSemester - II

Course Title: Quantum Mechanics	**Course Code:** 21PHY2C6L
Total Contact Hours: 55 Hours	**No. of Credits:** 04
Formative Assessment Marks: 30	**Duration of ESA/Exam:** 03 Hours
Summative Assessment Marks: 70	

Course Outcomes (COs):

At the end of the course students will be able to:

1. Distinguish between phenomena at classical and quantum level.
2. Apply basic formalism of quantum mechanics to simple physical systems.
3. Apply Schrodinger time independent wave equation to subatomic particles.
4. Apply quantum mechanical approximation methods to physical systems.

DSC6: Quantum Mechanics (21PHY2C6L)

Unit	Description	Hours
1	**Physical basis of quantum mechanics**: Experimental background: inadequacy of classical Physics, Planck's quantum hypothesis, Bohr model of Hydrogen spectra, Correspondence principle, experimental observations of quantized orbits, inadequacy of quantum theory. **Schrodinger wave equation** Development of Schrodinger wave equation: One-dimensional and extension to three dimensions inclusive of forces. Interpretation of wave function: Statistical interpretation, normalization, expectation value and Ehrenfest's theorem. Energy eigen functions: separation of wave equation, boundary and continuity conditions.	11
2	**Some exactly solvable eigen value problems** One dimensional: Square well and rectangular step potentials, Rectangular barrier, Harmonic oscillator. Three dimensional: Particle in a box. Particle in a spherically symmetric potential, rigid rotator, Hydrogen atom	11
3	**General formalism** Hilbert space, observables, quantum mechanical operators – definition and	11

	properties, eigen values and eigen vectors of an operator; Hermitian operator, unitary and projection operators. Commuting operators and complete set of commuting operators. Bra and ket notation for vectors. The fundamental postulates, General uncertainty relation, Dirac notations.	
4	**Representation theory:** Matrix representation of an operator, co-ordinate and momentum representations. Expectation values, matrix method solution of linear harmonic oscillator. **Approximation methods for stationary states:** Time independent perturbation theory– Variation method, eigen values in the first approximation, perturbed harmonic oscillator. Application to an harmonic oscillator and to the ground state of Helium atom. WKB method: Application to barrier penetration, Bohr-Sommerfeld quantum condition.	11
5	**Theory of Scattering** Scattering cross-section, wave mechanical picture of scattering, scattering amplitude. Born approximation. Partial wave analysis: phase shifts, scattering amplitude in terms of phase shifts, optical theorem; exactly soluble problem-scattering by square well potential.	11

References:

1. Quantum Mechanics: L I Schiff [McGraw-Hill, NY, 1968]
2. Quantum Mechanics : G Aruldas, PHI Learning Private Ltd.,(2nd Edn.), 2013.
3. Quantum Mechanics by Satya Prakash and Swati Saluja, KNRN Publishers, 2016.
4. Quantum Mechanics: V K Thankappan [Wiley Eastern, 1980]
5. Quantum Mechanics: Theory and Applications: A K Ghatak&S Loknathan (5th Edn.) [MacMillan India Ltd., 2010]
6. Modern Quantum Mechanics: Sakurai J J and Tuan S F [Addison Wesley 1999]
7. A Text book of Quantum Mechanics: P M Mathews and K Venkateshan [TMH, 1994]

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Department Name: PhysicsSemester - II

Course Title: Condensed Matter Physics	**Course Code:** 21PHY2C7L
Total Contact Hours: 55 Hours	**No. of Credits:** 04
Formative Assessment Marks: 30	**Duration of ESA/Exam:** 03 Hours
Summative Assessment Marks: 70	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Explain the fundamental concepts of crystal structure.
2. Apply X-ray diffraction technique to analyse crystal structure of materials.
3. Explain bonding and imperfections in crystals.
4. Apply lattice vibrations theory to analyse specific heat of solids.
5. Apply band theory of solids to analyse properties of solids.
6. Explain fundamentals of semiconductors, superconductors and liquid crystals.

DSC7: Condensed Matter Physics (21PHY2C7L)

Unit	Description	Hours
1	**Crystal Structure** Fundamentals of Crystal structure – Crystal lattice and Translation vectors, Unit Cell, Concept of Weigner-Seitz cell, Basis; Symmetry Operations, Point groups and Space groups, Types of Lattices – Two dimensional and three dimensional lattices; Lattice directions and planes, Interplanar spacing, Simple crystal structures – Close- packed structures and Loose-packed structures with examples, Crystal structure of diamond and NaCl. (Ref.1 & 4)	11
2	**X-ray diffraction and Bonding in Solids** X-ray diffraction, Bragg's treatment- Bragg's law, The Von Laue Treatment – Laue's Equations, X-Ray diffraction methods – The Laue's method, Rotating Crystal method and Powder method; Atomic scattering factor, Geometrical scattering factor and Extinction rules for cubic crystals, Qualitative discussion on Neutron and Electron diffraction.(Ref.1, 2 & 4). Interatomic forces and types of bonding- Ionic, Covalent, Metallic, Van der waal'	11

	and Hydrogen bonds; Binding Energy in ionic crystals – Evaluation of Madelung constant and determination of Range; Binding Energy of Crystals of inert gases. (Ref.1 & 4).	
3	**Imperfections in Crystals and Lattice vibrations** Point imperfections - Schottky and Frenkel defects and their equilibrium concentrations; Line imperfections - Dislocations and their types, Stress fields of dislocations; Planar imperfections - Grain boundary; Colour centers – F Centers and other Centers in alkali halides. (Ref.4 & 5) Vibrations of 1D monoatomic and diatomic lattices, Phonons, Momentum of Phonons, Inelastic scattering of photons by phonons, Specific heat – Classical theory, Einstein's theory and Debye's theory. (Ref.1 & 2)	11
4	**Free Electron Theory of Metals and Band theory of Solids** Qualitative discussion of Free – Electron Model of metals; Electrical conductivity, Electrical Resistivity versus Temperature, Heat Capacity of Conduction Electrons, Fermi Surface, Electrical Conductivity and Effects of Fermi Surface, Thermal conductivity in Metals (Ref.2) Bloch theorem, Kronig-Penny Model, Brillouin zone and construction in square lattice, Energy versus wave-vector relationship – different representations/zone schemes, Number of wavefunctions in a band, Velocity and Effective mass of electron, Distinction between metals, insulators and semiconductors. (Ref.1)	11
5	**Semiconductors, Superconductors and Liquid crystals** Types of semiconductors, Conductivity in intrinsic semiconductors and its variation with temperature, Carrier concentration and Fermi level for intrinsic semiconductors, Carrier concentration (quantitative), Fermi level and conductivity in extrinsic semiconductors, Hall Effect and its applications (Ref.1 ,3 & 4) Superconductors, Meissner effect, Supercurrents and penetration depth, Criticalfield and critical temperature, Type I and Type II superconductors, BCS theory (qualitative), Qualitative discussion on MAGLEV, Superconducting magnet, Josephson effects. (Ref. 1, 2 & 4) Liquid crystals: Classification, Orientational order and inter molecular forces, Optical properties and applications. (Ref. 2)	11

References:

1. **Solid State Physics by R. K. Puri & V. K. Babbar, S. Chand Publications.**
2. **Elementary Solid State Physics by M. Ali Omar, Pearson Education.**
3. **Solid State Physics by S .O. Pillai, New Age International.**
4. **Introduction to Solid State Physics by C. Kittel, Wiley Eastern Ltd.**

5. **Elements of Solid State Physics by J.P Srivastava, PHI Learning Pvt. Ltd.**

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Department Name: PhysicsSemester - II

Course Title: Nuclear Physics	**Course Code:** 21PHY2C8L
Total Contact Hours: 55 Hours	**No. of Credits:** 04
Formative Assessment Marks: 30	**Duration of ESA/Exam:** 03 Hours
Summative Assessment Marks: 70	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Explain the basic properties of nucleus and nuclear forces.
2. Explain fundamental nuclear reactions and nuclear models.
3. Describe nuclear decay types and fundamental interaction of radiation with matter.
4. Explain the principles and applications of nuclear radiation detectors.
5. Discuss the basics of nuclear energy, fundamental interactions and elementary particles.

DSC8: Nuclear Physics (21PHY2C8L)

Unit	Description	Hours
1	**Basic Properties of Nucleus** Nuclear constitution. The notion of nuclear radius and its estimation from Rutherford's alpha scattering experiment, Coulomb potential inside the nucleus and the mirror nuclei. The nomenclature of nuclei and nucleon quantum numbers. Nuclear spin and Magnetic dipole moment. Nuclear electric moments and shape of the nucleus. **Nuclear Forces** General features of nuclear forces. Bound state of Deuteron with Square Well Potential, Binding Energy and size of Deuteron, electric and magnetic moments- evidence for non-central nature of nuclear forces. Yukawa's meson theory of nuclear forces.	11
2	**Nuclear Reactions** Reaction scheme, types of reactions and conservation laws. Reaction kinematics, threshold energy and Q-value of nuclear reaction. Energetics of exoergic and endoergic reactions. **Nuclear Models**	11

	The Shell Model; Evidence for magic numbers, energy level, scheme for nuclei with infinite square well potential and the ground state spins. The Liquid Drop Model: Nuclear Binding Energy, Bethe-Weizsacker's Semi Empirical Mass Formula.	
3	**Nuclear Decays** Alpha decay: Quantum mechanical barrier penetration, Gamow's theory of alpha decay, range and energy of alpha particles and their relations, Half-life systematics. Beta decay: Continuous beta spectrum, Pauli's Neutrino Hypothesis and Fermi's theory of beta decay, Double beta decay, beta comparative half-life systematics. Gamma decay: Qualitative consideration of multipole character of gamma radiation-Selection Rules; Systematics of mean lives for gamma multipole transitions, Gamma ray spectra and nuclear energy levels, Nuclear Isomerism, Internal Conversion (Qualitative).	11
4	**Interaction of Radiation with Matter** Interaction of Charged Particles with Matter, Ionization Energy Loss, Stopping Power and Range Energy Relations for Charged Particles, Cerenkov Radiation, Synchrotron Radiation, Interaction of Gamma Rays: Photoelectric Absorption, Compton Scattering and Pair Production Processes. **Nuclear Detectors** Introduction, Ionization Chamber, Semiconductor Detectors: Surface Barrier, Ge(Li) and HP-Ge; Proportional Counter, G M Counter, Scintillation Detector, Solid State Nuclear Track Detectors (SSNTD).	11
5	**Nuclear Energy** Fission Process, Fission Chain Reaction, Four Factor Formula and Controlled Fission Chain Reactions, Energetics of Fission Reactions, Fission Reactor. Fusion Process, Energetics of Fusion Reactions, Controlled Thermonuclear Reactions, Fusion Reactor, Stellar Nucleosynthesis. **Fundamental Interactions and Elementary Particles** Basic fundamental interactions and their characteristic features. Elementary particles, Classification of Elementary particles, Conservation laws in elementary particle decays. Quark model of elementary particles.	11

Department Name: PhysicsSemester - II

Course Title: Model based Design of Physical Devices/ Systems	**Course Code:** 21PHY2S2LP
Total Contact Hours: 42 Hours	**No. of Credits:** 02
Formative Assessment Marks: 20	**Duration of ESA/Exam:** 01 Hours
Summative Assessment Marks: 30	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Identify the semiconductor devices.
2. Design the electronics circuits.
3. Explain the Model based simulations.
4. Simulate rotors using virtual lab.
5. Demonstrate the installation of FOSS.

SEC2: Model based Design of Physical Devices/ Systems (21PHY2S2LP)

Unit	Description	Hours
1	**Model based simulation of Rectifiers** Review of Physical devices: p-n Junction, Transistor, Op-amp. Design and model analysis simulations: Rectifiers: Half wave rectifiers, Full wave rectifiers, rectifiers with filters. Clipping and clamping. Model based fault detection in the circuits.	14
2	**Model based simulation of Rotors** Concept of virtual lab. Mathworks, Modal analysis simulation of rotor system, Simulation of unbalance analysis, Single plane balancing of rigid rotor, Two plane balancing using Matlab software.	14
3	**Free and Open-source software (FOSS) and hardware** Introduction to Linux, Python and Python library, Installation, Interfacing hardware. Conversion of PC into CRO, Model Simulation of Acoustic, Mechanical and Thermal properties. Optical sensor using Expeyes, Radiation and its detection: Alpha energy spectrometer.	14
References: 1. Robert Boylestad, Louis Nashelsky- Electronic Devices And Circuit Theory,Prentice Hall Upper Saddle River, New Jersey Columbus, Ohio		

Department Name: PhysicsSemester - II

Course Title: Computational Physics Lab	**Course Code:** 21PHY2C5P
Total Contact Hours: 52 Hours	**No. of Credits:** 02
Formative Assessment Marks: 20	**Duration of ESA/Exam:** 04 Hours
Summative Assessment Marks: 30	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Write a computational program for various numerical techniques.
2. Compute errors in any experimentation.
3. Write a computational program for solution of problems in physics.

DSC5P3: Computational Physics Lab (21PHY2C5P)

List of Computations

1. Error, Absolute Error, Relative Error and Percentage Error.
2. Linear least square fitting.
3. Solution of quadratic equation.
4. Solution of polynomial equation.
5. Newton's forward and backward interpolations.
6. Numerical integration by Simpson's 1/3 and 3/8 rules.
7. Numerical integration by Trapezoidal rule
8. Numerical integration by Runge-Kutta Method.
9. Solution of differential equation.
10. Gauss elimination method.
11. Programming in C for solution of problems in physics-examples from atomic and molecular physics, nuclear physics, mechanics, electrodynamics, quantum mechanics, solid state physics.

Note:

1. Minimum of EIGHT computations must be carried out.
2. Computations may be added as and when required with the approval of BoS.

References:

1. https://www.sanfoundry.com/c-programming-examples-numerical-problems-algorithms/
2. INTRODUCTION TO NUMERICAL ANALYSIS WITH C PROGRAMS by ATTILA M´AT´E, Brooklyn College of the City University of New York, July 2004.

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Department Name: PhysicsSemester - II

Course Title: Condensed Matter Physics Lab	**Course Code:** 21PHY2C7P
Total Contact Hours: 52 Hours	**No. of Credits:** 02
Formative Assessment Marks: 20	**Duration of ESA/Exam:** 04 Hours
Summative Assessment Marks: 30	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Design experiments to study properties of crystals.
2. Compute parameters of crystalline materials.
3. Design experiments to study electrical and thermal properties of solids.

DSC7P4: Condensed Matter Physics Lab (21PHY2C7P)

List of Experiments

1. Determination of inter-planar spacing using X-ray powder pattern.
2. Analysis of X-ray diffraction pattern.
3. Structure factor determination: Computations.
4. Intensity calculations of X-ray powder pattern: Computations.
5. Fermi energy of metals.
6. Temperature variation of resistivity of a semiconductor: four probe method.
7. Measurement of resistivity of a semiconductor by four probe method (fixed temperature)
8. Energy gap of semiconductor by four probe method.
9. Determination of Debye's temperature of Lead or Tin.
10. Study of Lattice Dynamics.
11. Activation energy of point defects in metals: Experiment/Computation.
12. Acoustic waves in solids – Measurement of Ultrasonic velocity in solids.
13. Magneto-resistance of semiconductors.
14. Study of Hall Effect in semiconductors.
15. Energy gap of PN-junction diode/LED.

Note:

1. Minimum of EIGHT experiments must be carried out.
2. Experiments may be added as and when required with the approval of BoS.

References:

5. University Practical Physics by D.C. Tayal, Himalaya Publishing House, First Millenium Edition, 2000.
6. Advanced Practical Physics for students by B.L. Flint and H.T. Worsnop, Asia Publishing House, 1971.
7. A Text Book of Practical Physics, I. Prakash & Ramakrishna, Kitab Mahal, 11th Edition, 2011.
8. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, Heinemann Educational Publishers, 4th Edition, 1985.

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Department Name: PhysicsSemester - II

Course Title: Nuclear Physics Lab	**Course Code:** 21PHY2C8P
Total Contact Hours: 52Hours	**No. of Credits:** 02
Formative Assessment Marks: 20	**Duration of ESA/Exam:** 04 Hours
Summative Assessment Marks: 30	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Design experiments to Study properties of nucleus.
2. Determine the physical parameters of nuclear radiations/radioactive sources.
3. Compute the half life of any radioactive materials by various methods.

DSC8P5: Nuclear Physics Lab (21PHY2C8P)

List of Experiments

1. Nuclear counting statistics: Verification of Poisson Distribution.
2. GM Counter characteristics: Determination of Operating voltage.
3. Determination of dead time of GM Counter – single source.
4. Verification of inverse square law for nuclear radiation.
5. Attenuation of β-rays in Aluminium.
6. Attenuation of γ-rays.
7. Half life of K-40.
8. Semi empirical mass formula and binding energy analysis.
9. Nuclear radius calculation.
10. Analysis of β-spectrum and half life systematics.
11. Study of Scintillation Detector (NaI)
12. α -ray spectrometer
13. β -ray spectrum using scintillation detector
14. γ-ray spectrum using scintillation detector: single channel analyser

Note:

1. Minimum of EIGHT experiments must be carried out.
2. Experiments may be added as and when required with the approval of BoS.

References:

1. Experiments in Nuclear Science, ORTEC Applications Note. ORTEC (1971).
2. Practical Nucleonics by F. J. Pearson and R. R. Dsborne.
3. Experimental Nucleonics by E. Bleuler and G. J. Goldsmith, Rinehart.

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CBCS Question Paper Pattern for M.Sc. Physics Semester End Examination

with Effect from the AY 2021-22

Disciplines Specific Core (DSC) and Discipline Specific Elective (DSE)

Paper Code: **Paper Title:**

Time: 3 Hours **Max. Marks: 70**

Note: Answer any *FIVE* of the following questions with Question No. 1 (Q1) Compulsory, eachquestion carries equal marks.

Q1. 14 Marks

Q2. 14 Marks

Q3. 14 Marks

Q4. 14 Marks

Q5. 14 Marks

Note: Question No.1 to 5, *one question from each unit* i.e. (Unit I, Unit II, ….). The Questions may be a whole or it may consists of sub questions such as a,b, c etc…

Q6. 14 Marks

Note :Question No.6, *shall be from Unit II and III,* the Question may be a whole or it may consists of sub questions such as a,b, c etc…

Q7. 14 Marks

Note: Question No.7*, shall be from Unit IV and V*, the Question may be a whole or it may consists of sub questions such as a,b, c etc…

Q8. 14 Marks

Note: Question No-8 shall be from *Unit II, Unit III , Unit IV and Unit V.* The question shall have the following sub questions and weightage. i.e a – 05 marks, b – 05 marks, c – 04 marks.

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CBCS Question Paper Pattern for M.Sc. Physics Semester End Examinationwith Effect from the AY 2021-22

Skill Enhancement Courses (SECs)

Paper Code: **Paper Title:**

Time: 1 Hours **Max. Marks: 30**

There shall be Theory examinations of Multiple Choice Based Questions [MCQs] with Question Paper set of A, B, C and D Series at the end of each semester for SECs for the duration of One hour (First Fifteen Minutes for the Preparation of OMR and remaining Forty-Five Minutes for Answering thirty Questions). The Answer Paper is of OMR (Optical Mark Reader) Sheet.

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CBCS Question Paper Pattern for M.Sc. Physics Semester End Examinationwith Effect from the AY 2021-22

Subjects with Tutorial

For the subjects with Tutorial component, there is no Semester-End Examination (SEE) to the component C3. The liberty of assessment of C3 is with the concerned faculty. The faculty must present innovative method of evaluation of component C3 before the respective BoS for approval and the same must be submitted to the Registrar and Registrar (Evaluation) before thecommencement of the academic year.

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